

## Claims

1. An interacting method for a Wireless Local Area Network (WLAN) user equipment (UE) fast selecting a mobile communication network to access in WLAN interworking network, wherein comprising the steps of:

initiating an authentication procedure after the connection between a WLAN UE and a WLAN Access Network (AN) is established;

sending a User Identity Request message to said WLAN UE;

on receiving said User Identity Request message, deciding network selection information to be carried based on the information of the WLAN covering the WLAN UE and/or the WLAN information stored in the WLAN UE, and returning a message carrying said network selection information to said WLAN AN;

deciding whether said network selection information in the received message indicates a mobile communication network to which the WLAN AN is able to route an authentication request message, if yes, the authentication request message of said WLAN UE will be forwarded to the mobile communication network indicated in the network selection information, and otherwise, sending a notification signal to said WLAN UE, and directing said WLAN UE to perform subsequent operations.

2. The method according to Claim 1, further comprising the steps of:

pre-configuring a mobile communication network with the highest priority to be accessed by said WLAN UE.

3. The method according to Claim 2, wherein, said WLAN information refers to WLAN identity information; and

said step of deciding network selection information comprises:

obtaining the identity information of the current WLAN, matching the obtained WLAN identity information and the WLAN identity information stored in said WLAN UE, if the identity information of the current WLAN and the corresponding network selection information is stored in said WLAN UE, regarding the network selection information corresponding to the identity information of current WLAN as the network selection information to be carried; otherwise, said pre-configured mobile

communication network with the highest priority will be carried as the network selection information .

4. The method according to Claim 3, wherein, further comprising the steps of:

judging whether the identity information of the current WLAN is stored in said WLAN UE when the WLAN UE has successfully accessed the mobile communication network indicated in the network selection information, if not, storing the identity information of the WLAN, and storing the information of the mobile communication network being successfully accessed as the network selecting information corresponding to identity information of the WLAN; otherwise, no storing is performed.

5. The method according to Claim 2 or Claim 3, wherein, said pre-configured mobile communication network with the highest priority is the home network.

6. The method according to Claim 3, wherein, said WLAN identity information refers to Access Point Identity (APID).

7. The method according to Claim 6, wherein, said Access Point Identity (APID) is Media Access Control (MAC) address of the Access Point (AP).

8. The method according to Claim 4, further comprising the steps of:

setting a valid survival time for the stored network selection information to make the stored contents invalid when overtime, after storing the WLAN identity information and its corresponding network selection information.

9. The method according to Claim 8, further comprising the steps of:

judging whether the stored network selection information corresponding to the identity information of the WLAN exceeds the valid survival time, when the identity information of the current WLAN matches the stored WLAN identity information, if yes, regarding the pre-configured mobile communication network with the highest priority as the network selection information to be carried; and otherwise, regarding the network selection information as the network selection information to be carried, and the valid survival time being consumed continuously.

10. The method according to Claim 8, further comprising the steps of:

judging whether the WLAN UE has stored the information of the mobile communication network which is currently accessed with success, when the WLAN UE has successfully accessed the mobile communication network indicated in the network selection information; if there is no such information stored, storing the identity information of the WLAN, together with said information as the network selection information corresponding to the identity information of the current WLAN, and resetting the valid survival time of the currently stored network selection information; and otherwise, judging whether said WLAN UE has adopted the network selection information corresponding to the identity information of the WLAN stored by said WLAN UE to access, if yes, consuming the valid survival time of the network selection information continuously; and otherwise, resetting said valid survival time of the network selection information.

11. The method according to Claim 4, further comprising the steps of:

setting a valid usage times for the stored network selection information, after storing the WLAN identity information and its corresponding network selection information.

12. The method according to Claim 11, further comprising the steps of: if the identity information of the current WLAN is stored in said WLAN UE, judging whether the valid usage times of the stored network selection information corresponding to the identity information of current WLAN have been consumed, if yes, regarding the pre-configured mobile communication network with highest priority as the network selection information to be carried; otherwise, regarding the network selection information as the network selection information to be carried, and the valid usage time being consumed continuously.

13. The method according to Claim 11, further comprising the steps of:

judging whether the WLAN UE has stored the mobile communication network of the current successful access, when the WLAN UE has successfully accessed the mobile communication network indicated in the network selection information; if there is no such information stored, storing the mobile communication network of the current successful access as the network selection information corresponding to the identity information of the current WLAN together with the identity information of the WLAN, and resetting the valid usage times of the currently stored network

selection information; and otherwise, judging whether said WLAN UE has adopted the network selection information corresponding to the identity information of current WLAN it stores to access, if yes, consuming the valid usage times of the network selection information continuously; otherwise, resetting the valid usage times of the network selection information.

14. The method according to Claim 9 or 12, further comprising the steps of:

deleting the identity information of the WLAN and its corresponding network selection information stored by the WLAN UE, when the valid survival time corresponding to the network selection information is over or the valid usage times corresponding to the network selection information are consumed.

15. The method according to Claim 4, 10 or 13, further comprising the steps of:

setting a threshold of the number of the information permitted to be stored in the WLAN UE, judging whether the identity information of the current WLAN and its corresponding network selection information exceeds said threshold of the information number permitted to be stored, if yes, deleting old or selected information, and storing the identity information of the WLAN and its corresponding network selection information; and otherwise, storing the identity information of the WLAN and its corresponding network selection information.

16. The method according to Claim 1, wherein said network selection information is contained in the Network Access Identity (NAI).

17. The method according to Claim 1, wherein said step of sending a notification signal to said WLAN UE comprises:

re-selecting a mobile communication network, and obtaining the network information corresponding to the selected mobile communication network according to the notification signal; and sending a message carrying the selection information of the new network to the WLAN AN.

18. The method according to Claim 17, further comprising the steps of:

waiting for response messages from said WLAN UE for a certain time, if no response has been received, sending a Selection Result Request to said WLAN UE.

19. The method according to Claim 17, wherein said step of sending the notification signal comprises:

closing the current authentication process,

re-selecting a mobile communication network, and re-initiating an authentication procedure to the WLAN AN and sending access authentication information carrying the new network selection information.

20. The method according to Claim 1, wherein said step of sending a notification signal to said WLAN UE comprises:

indicating the WLAN UE that the current selected network is invalid and downloading the mobile communication network information needed,

said WLAN UE determining whether to download the mobile communication network information, if yes, said WLAN UE returning a response of needing to download the network information;

sending the mobile communication network information to said WLAN UE on receiving the response;

after getting, re-selecting a mobile communication network on receiving the mobile communication network information, and re-sending an Access Authentication Request carrying said network selection information to the WLAN AN; otherwise, doing nothing or returning response information indicating that no downloading is needed.

21. The method according to Claim 20, further comprising the steps of:

waiting for the response from the WLAN UE for certain time on sending the notification signal and, if one is received, sending mobile communication network information to said WLAN UE.

22. The method according to Claim 20, further comprising the steps of:

finishing the current process flow on sending the notification signal; if the network information needs to be downloaded, initiating a network information downloading flow.

23. The method according to Claim 17 or 20, wherein automatically selecting mobile communication network information sent by the network according to parameters set in advance.